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The Platform Shapes the Message: How Website Design Affects Abstraction and Valence of Online Consumer Reviews

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Abstract

Online consumer reviews provide relevant information about products and services for consumers. In today's networked age, the online consumer review platform market is hyper-competitive. These platforms can easily change different design characteristics to get more reviewers and to nudge reviewers to deliver higher quality reviews. This study explored the relation between online consumer review platforms' design characteristics and the reviewers' construal level. A psycholinguistic coding scheme was used to assess which social and physical design characteristics impact the language abstraction in accompanying online consumer reviews. To this end, we content analyzed reviews of services and products posted on eight different online consumer review platforms (N = 400). This resulted in a number of key design characteristics (e.g., reviewer identification, reviewer status, order of instructions and length instructions) that led to a decrease in language abstraction used in online consumer reviews. Moreover, results showed that language abstraction mediated the relationship between the four design characteristics and valence. The findings and their broader theoretical, methodological and practical implications are discussed. Online consumer review platforms could capitalize on our findings in adaptive design choices.

Keywords: Online Consumer Review Platform; Design Characteristics; Construal Level Theory; Language Abstraction; Valence; Content Analysis

1. Introduction

Online consumer reviews are an important source of information. This type of electronic word-of-mouth (eWOM) communication is increasingly prevalent and affects organizations and consumers (King, Racherla, & Bush, 2014; Rosario, Sotgiu, DeValck, & Bijmolt, 2016). Consumers consult these online consumer reviews to know the opinion of others and share experiences about products and services (de Valck, van Bruggen, & Wierenga, 2009; Cheung & Lee, 2012). The strong presence of online consumer reviews encouraged several researchers to study their impact. Previous research focused mostly on the effects of online consumer reviews on readers' attitudes and purchase intentions (e.g. Chevalier & Mayzlin, 2006; Walther, Liang, Ganster, Wohn, & Emington, 2012), and reviews' perceived trust and usefulness (e.g. Banerjee, Bhattacharyya, & Bose, 2017; Willemsen, Neijens, Bronner & de Ridder, 2011). It has been demonstrated that more concrete reviews which contain more detailed information are perceived as more helpful and credible than abstract reviews which contain less detailed information (Jiménez & Mendoza, 2013).

Taken together, most literature on online consumer reviews established the relationship between review characteristics (such as source and valence) and their impact on consumer behavior (Cheung & Thadani, 2012; King et al., 2014). Less is known about the factors influencing the consumer who writes online consumer reviews. In this research, we examine how design characteristics of online consumer review platforms influence the language of online consumer reviews. We focus on language use and valence, because these elements have been shown to affect the impact of online consumer reviews on decisions of other consumers that read them (Schellekens, Verlegh, & Smidts, 2010; 2012). We examine four different characteristics of review platforms (i.e. reviewer identification, reviewer status, order instructions, and length instructions). These factors represent variations in platform design that are available in existing review platforms, which allows for field testing of our ideas, and at the same time ensures that each of these factors can be changed by platform owners. We thus provide guidance on design features in information systems such as online review platforms which could be helpful to consumers in task execution, problem solving, and

decision-making (Morana, Schacht, Scherp, & Maedche, 2017). With this knowledge, the design of online consumer review platforms could be optimized.

Our theoretical framework builds on *construal level theory* (CLT), which is an influential theory in social psychology and consumer research (Trope & Liberman, 2010). We regard the present study as exploratory in the sense that it offers a first exploration of how design characteristics in the field could be related to psychological distance, and therefore to language abstraction. Future (experimental) work should manipulate or measure psychological distance in order to more firmly establish the implied psychological mechanism and its impact on language and other characteristics of online reviews. In this study, we thus hope to take a first step towards a better understanding of the language used in the descriptions of products and services in online consumer reviews. The purpose is to examine how design characteristics of online review platforms are related to the extent to which consumer describe their experiences abstractly or concretely. More specifically, this study examines whether there is a connection between review websites' characteristics on the one hand and reviews' language style on the other hand: how are (in terms of language abstraction and valence) experiences with a product or service described? This research will provide insight in how review websites' design characteristics can impact how online consumer reviews are written. The contributions of this research are twofold. From a theoretical perspective, the study integrates principles from different domains, which help us understand the relations between platforms and reviewers. Importantly, we are the first to study how review style is related to the design characteristics of the platform on which the online consumer review is provided. From a managerial perspective, our findings have implications for both marketers and designers of online consumer review platforms. Design characteristics could be used to get more reviewers and reviews higher in information quality.

2. Theoretical background

2.1. Online consumer review platforms

An online consumer review platform is a designated type of electronic medium for word of mouth, where such e-WOM could also exist in non-specific online media such as a blog, a news

group, and a social networking site (Li & Du, 2011). Online consumer review platforms are defined as "platforms that provide consumers with the opportunity to read others' consumption opinions and experiences as well as write (i.e., publish) contributions by themselves" (Hennig-Thurau, Gwinner, Walsh, & Gremler, 2004, p. 40). These platforms are websites, sections of websites or software tools (e.g., apps) on which consumers can publish reviews about products and services and on which consumers can seek relevant information for a prospective purchase. Online consumer review platforms collect online consumer reviews by 'everyday' consumers rather than those with expert experience (Cheung & Lee, 2012; de Valck et al., 2009; Walther, 1995). Because most of these platforms (e.g., Amazon Customer Reviews, Tripadvisor, Yelp etc.) are free and open to access, anyone can benefit. Recent research even suggests that appropriate design and policy in online review systems is needed to improve the quality and validity of online reviews, resulting in representative and more trustful ratings (Askalidis, Kim, & Malthouse, 2017).

For online consumer review platforms it is important to gain a competitive advantage through the successful identification and implantation of tools that improve the communication of their review system (Lee, 2012). By changing design characteristics, platforms could get reviews higher in information quality. Prior research revealed that information quality and system quality influence decision-making satisfaction (Bharati & Chaudhury, 2004), and perceived review helpfulness (Chua & Banerjee, 2016). It has as well been demonstrated that review websites' design can improve consumers' online product choices (Park & Kim, 2008; Senecal & Nantel, 2004). However, prior research only scantly investigated how specific design characteristics of online consumer review platforms can assist or obstruct the review process.

Online consumer review platforms create an environment in which consumers provide and gather information through a readily provided interface (Lee, 2012). Reviewers can easily and individually process both social and physical cues which are present on online consumer review platforms. Social cues are important on online consumer review platforms, because these platforms aim to create links between readers and writers across time and space (Dellarocas, 2003). Reviewer identification (e.g., username, location, hobbies) and reviewer experience could increase favorable

perceptions about the retailer and could improve trustworthiness and credibility. Such social factors present supplementary depth in interpersonal interactions (Turley & Milliman, 2000). In addition to social elements, physical elements such as product pictures, display of information as a summary, instructions on the order, length instructions, etc. could influence user responses by improving the transmission of information, and the navigation across the website (Lee, 2012). Today's platforms have more power and enable the design of highly configurable interfaces in order to provide higher usability for each user (Shim et al., 2002). Those decision support systems could be used to support reviewers with writing. We thus argue that both social and physical design characteristics could also influence the way people write online consumer reviews.

2.2. Construal level theory

To obtain a systematic understanding of the influence of online consumer review platform design characteristics on review style and influence, we build on the psychological distance part of the *construal level theory* (Trope & Liberman, 2010). The *construal level theory* assumes that people form abstract mental construals of distal objects whereas concrete mental construals pertain to near objects (Trope & Liberman, 2003). This means that although we cannot see or feel anything else but a concurrent (here and now) object, we can think about the future, remember the past or speculate, all of which are mental constructions. These constructions represent psychologically distant objects. According to CLT, a lower psychological distance corresponds to a subjective feeling that something is close to the self). People are thought to think more concretely about objects, events or people that are more close to the self (Fujita, Trope, Liberman, & Levin-Sagi, 2006; Trope & Liberman, 2003). Conversely, when psychological distance increases, one will think in a more abstract way and use increasingly higher levels of construal. The dimension of these levels is derived from *action identification theory* (Vallacher & Wegner, 1987). A central idea in action identification theory is that people develop cognitive representations of behaviors that may vary in the amount of detail that they convey about the behavior. High levels of construal represent the tendency to understand an action in terms of its consequences and implications, whereas low levels of construal represent the tendency to see things in terms of its details (Vallacher & Wegner, 1987). Past research on CLT has mainly been

carried out in a lab setting (Eyal, Liberman, Trope, & Walther, 2004; Fujita et al., 2006; Herzog, Hansen, & Wänke, 2007), although a recent field study examined a large sample of *Tripadvisor* restaurant reviews (Huang, Burtch, Hong, & Polman, 2016), demonstrating that psychological distance towards the reviewed object or service affects the review writing. Other research found that the type of good could impact the language abstraction in reviews, with experience goods containing more details than search goods (Chung, Moon, Yoo, & Choe, 2006). Psychological distance is related to construal levels, which can be translated into levels of language abstraction.

In such a construal level perspective on consumer reviews, concrete reviews contain more detailed information about a product than abstract ones do. Consider for example the following reviews: "The coffee machine I bought, works energy-efficient with an adjustable water tank which results every morning in a genuinely tasty cup of coffee." (concrete) as opposed to "The coffee machine has great quality and is easy-to-use!" (abstract). The concrete written review is associated with a low-level of mental construal and associated with psychological proximity and represented in low-level terms of concrete and peripheral features (Trope & Liberman, 2003).

This distinction between abstract and concrete language is derived from the *linguistic category model* (Semin & Fiedler 1988), which is a frequently used framework for studying the language that people use to describe interpersonal behavior. This model refrains from a subjective analysis of the content and meaning of specific words, focusing instead on more general linguistic aspects of language use (Semin & Fiedler, 1988). More specifically, the model puts an emphasis on the level of abstractness of the verbs and predicates that are used to describe behavior and as such distinguishes four different categories of verbs and predicates (Maass, Salvi, Arcuri & Semin, 1989; Semin & Fiedler, 1988). According to theory, social events may be described at various levels of abstraction. For example, at the first level we find descriptive action verbs (DAV's), which exist of noninterpretive descriptions of some events (e.g., Ann gives Ben a compliment). Interpretative action verbs (IAV's) form the second category, which consists of more particular observable behaviors (e.g., Ann appreciates Ben). Next, state verbs (SV's) describe a persistent unobservable state of the performer and thus a particular behavior (e.g., Ann admires Ben). Finally, in the most abstract level

adjectives (Adj.) can be found which are used to describe the actor. Adjectives generalize the behavior to the trait level (e.g., Ann is friendly). Recently, this model was applied to focus on the causes and consequences of using abstract versus concrete descriptions of experiences regarding products and services (Schellekens et al., 2010; 2012). This paper extends this reasoning to psychological distance, which can be influenced by the review website's design characteristics.

3. Research model

Based on the literature reviewed above, we developed a structural model of antecedents to language abstraction in online consumer reviews, depicted in Fig. 1. The four antecedent variables are elements that online consumer review platforms can manipulate in their social or physical design characteristics. We focus on those platform characteristics that can influence consumers at the time they write their review, by enhancing or decreasing psychological distance. In the following subsections, the key variables in the research model are defined and their interrelationships are addressed. Where possible, we use prior findings in the field of *construal level theory* to support our assertions about these relationships.

[FIGURE 1 ABOUT HERE]

3.1. Reviewer Identification and Language Abstraction

Given the growth of social networking and online opinion-sharing – and the high visibility of online consumer reviews in online searches – reviewers' identification has become extremely valuable. S*elf-presentation theory* (Bond, 1982) provides an explanation for the importance of user demographics when reviewing. This theory suggests that individuals have a desire to look competent in front of others. When people have to present themselves to others, they will perform at their best, and thus for instance provide detailed, valuable information to others. Recent research found that people are less willing to disclose identification elements when facing consumer privacy concerns (Wottrich, Verlegh, & Smith, 2017), thus disclosing personal information has been shown to have an influence on the information that is exchanged by consumers. A strong relationship between

adherence to norms of online identity disclosure and online information disclosure has been shown as well (Mesch & Beker, 2010): When a review writer knows to be identifiable (at least to some extent), we argue that psychological distance could decrease, resulting in a low-construal mindset. This, in turn, should lead to more concrete thinking (Trope & Liberman, 2010), and thus concrete review writing. This leads to the following hypothesis:

H1. When reviewers know they are (not) identifiable, they use more concrete (abstract) language.

3.2. Reviewer Status and Language Abstraction

Earlier research has pointed out that the strength of a virtual community, such as an online consumer review platform, is closely related to the heterogeneity of its member database (de Valck et al., 2009). In a virtual community there is a majority of non-experienced and a minority of highly experienced users who 'rule the game' (Kozinets, 2002). More experienced reviewers have a higher status and are seen as opinion leaders (de Valck et al., 2009). By the act of legitimization, they have control and normative influence over the others. Reviewers with a high experience status already built expertise, resulting in the ability to analyze at a higher level. It might be as well that they feel more superior because their knowledge on specific aspects accumulated over time (Rothaermel & Sugiyama, 2001). Most online consumer review platforms do not focus on a small group of highly experienced reviewers. Instead, they often use cues such that even those reviewers with just a few reviews feel experienced. Such review websites will provide some status information to its reviewers. Other review websites abstain from such practice, such that one's experience status is not visible to other readers. The visibility of such a status cue could lead reviewers to see themselves as more experienced, and research found that people describe their behavior with less detail as they gain experience (Vallacher & Wegner, 1987). We therefore propose the following hypothesis:

H2. When reviewers obtain a status (no status), they use more abstract (concrete) language.

3.3. Order of Instructions and Language Abstraction

Regarding the procedure of writing a review, online consumer review platforms differ from one another in terms of the type of information asked and the order in which this information must be given. For instance, Epinions asks to immediately write an online consumer review as opposed to Amazon, where reviewers first give a star rating before writing the review. From the perspective of CLT, assigning a star rating bolsters a more abstract representation than writing a review. Star ratings ask an overall evaluation of the object (Resnick, Zeckhauser, Friedman, & Kuwabara, 2000). Prior research has shown that construal level is raised (and thinking is more abstract) when consumers first provide a more general level evaluation of an object, and then a more detailed assessment of its attributes, rather than the other way around (Trope & Liberman, 2003). This in turn should lead to more abstract language in the review. We therefore propose that:

H3. When reviewers have to rate a product *before* they write, they use more abstract language.

3.4. Length Instructions and Language Abstraction

The instructed minimum length of an online consumer review can affect the information quality and quantity (Chevalier & Mayzlin, 2006). As the reviewer is required to write a minimum number of words, the reviewer would write longer online consumer reviews which possibly contain more detailed information. Online consumer reviews that provide details about specific features or anecdotal stories about the experience with the product or service should be more credible and helpful and are often longer than general ones that lack specific details (e.g., *"nice product", "sublime", "top service";* Jiménez & Mendoza, 2013). Research found as well that longer reviews contain more information about the product, relative to other, non-product related information (Racherla & Friske, 2012). When people are asked to write longer reviews, they would think at low-level construal and would focus on concrete features which provide more detailed information about the product or service (Trope & Liberman, 2003; Racherla & Friske, 2012). We assume the following hypothesis:

H4. When reviewers are (not) instructed to write a minimum of characters, they use more concrete (abstract) language.

3.5. Language Abstraction and Valence

Earlier research found that pro-arguments (pros) are more salient for distant-future actions than are counter-arguments (cons) and the reverse holds for closer-future actions (Eyal, et al., 2004). In general, *construal level theory* proposes that pros are more likely to constitute high-level construals and cons low-level construals (Trope & Liberman, 2003). From the CLT we may assume that positive arguments typically represent a more abstract evaluation compared to negative arguments (Herzog et al., 2007; Trope & Liberman, 2010). Moreover, recent research found that positive experiences were described more abstractly than negative ones were (Schellekens et al., 2010). When a reviewer writes an abstract online consumer review, the use of language would be more positive as compared to when he or she writes a concrete one. Based on this, we hypothesize:

H5. Language abstraction in reviews is positively related to valence in reviews.

3.6. Design Characteristics – Language Abstraction – Valence

The used level of language abstraction implicitly communicates a belief about the degree to which behavior reflects an underlying disposition of the actor. Some but limited research showed that the level of language abstraction used in descriptions of actions impacts the extent to which these descriptions affect those reading them. For example, Wigboldus, Semin and Spears (2000) found that when behavior was consistent with the stereotypes of the actor, the described behavior led to more dispositional inferences about the actor. Of importance is that this effect was mediated by the level of abstraction of the language used to describe this behavior. Thus, differences in language abstraction have important implications for how objects are evaluated (Wigboldus et al., 2010). Other research also found that people use the level of language abstraction of descriptions to infer whether the

communicator intended to be positive or negative (Douglas & Sutton, 2006). Translating, these findings to the online consumer review context, we propose the following hypothesis:

H6. The effect of design characteristics (their construal level) on valence in reviews is mediated by language abstraction in reviews.

4. Research method

4.1. Data collection

To empirically examine the relationships between the constructs in our research model, we conducted a content analysis of a varied sample of reviews of products and services. Answering the research question required a systematic content analysis of online consumer reviews on sufficient online consumer review platforms. The data for the content analysis are gathered from a selection of eight such platforms: Yelp, Epinions, Qype, Rate It All, Amazon, TripAdvisor, Iens and Kieskeurig. Given the exploratory nature of this research, we deliberately chose platforms that differ in a number of characteristics rather than sampling from the most popular ones. The sample includes both online consumer review platforms that focus solely on offering reviews (e.g., Epinions, Rate It All) and on online consumer review platforms where reviews are an additional, but not necessarily subordinate activity (e.g., Amazon, Kieskeurig). Next, the sample is diverse in terms of platforms' social strategy. For instance, online consumer review platforms like Yelp and Qype put a strong emphasis on creating an online community while the other platforms do not.

Online reviews (400) were collected via stratified random sampling. On each review website, one product or service was randomly chosen within a selected category. We arrived at a total of ten different categories (products or services) within every review website, and when there were no ten categories available, two or more products or services from the same category were collected. Each category was assigned a number, and with the aid of a random number generator a specific category was selected. We sampled five reviews for a random product within every category, resulting in 50 reviews/platform. Once the product or service was chosen, we focused on the five oldest reviews

(which were posted first). If less than five reviews were available for a particular product or service, the selection process was carried out again. Thus, we arrived at a database of 400 reviews (8 websites x 10 categories x 1 product or service x 5 reviews).

4.2. Measures

Online consumer review platforms have different design characteristics with which the reviewer is confronted before writing a review. Based on our literature study and the CLT, we assessed the following variables for each review website: *reviewer identification, reviewer status, order of instructions and length instructions*. To begin, we coded the absence (= 0) or presence (= 1) of reviewer identification, reviewer status and length instructions. For the variable order of instructions, we coded whether reviewers provided a star rating before (= 0) or after (= 1) they wrote their review. Since all four design characteristics could be determined objectively, only one rater coded the presence of these measures (Holsti, 1969).

In addition, both language abstraction and valence in the participants' written comments were coded. Following content analysis methodology (Holsti, 1969), three student coders independently processed all 400 online consumer reviews' language style. First, verbs and predicates in the online consumer reviews were coded according to the linguistic category model (Semin & Fiedler, 1988). A linguistic abstraction index was calculated for each review by summing the number of occurrences of Descriptive Action Verbs (DAVs, coded as 1), Interpretive Action Verbs (multiplied by the IAV code of 2), State Verbs (multiplied by the SV code of 3), and Adjectives (multiplied by the Adj. code of 4) and dividing this sum by the total number of verbs and adjectives used by the reviewer (Semin & Fiedler 1988)[1]. Interjudge reliability was high on average (α = .77). This model is the most commonly used technique for measuring language abstraction.

The online consumer review abstraction index was computed as

$$\frac{(1 \times f_{DAV} + 2 \times f_{IAV} + 3 \times f_{SV} + 4 \times f_{Adj.})}{(f_{DAV} + f_{IAV} + f_{SV} + f_{Adj})}$$

Where f_{DAV}, f_{IAV}, f_{SV}, and f_{Adj} represent the frequency of occurrences of each category. This normalized index ranges from 1 to 4. Second, valence of the online consumer reviews was rated by three independent coders who were not aware of the purpose of the study, and they did so on a seven-point Likert scale from negative (1) to positive (7). Prior research also used this scale to reveal effects of the rated valence in open-ended product descriptions (Schellekens et al., 2010). The intercoder reliability (α = .89) was high (Cronbach, 1951).

4.3. Analyses

Structural Equation Modeling (SEM) was used to test the relationships in our model. Analyses were performed using AMOS (Arbuckle, 2009). To investigate the suggested relationships, we tested the research model. The goodness of fit of the model was determined using the ratio of chi-square to degrees of freedom (χ^2/df), the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA) (Browne & Cudeck, 1992; Byrne, 2001).

5. Results

5.1. Descriptive Statistics

A total of 400 online consumer reviews (50 on each of the eight platforms) were examined. Across all online consumer review platforms, we saw that 69.0% of the online consumer reviews was written in English, 30.5% in Dutch and 0.5% in French, which follows from the used selection of online consumer review platforms. 110 users were men (27.5%) and 84 women (21.0%), and 206 user profiles did not mention any gender (51.5%). 224 (56.0%) of the user's online consumer reviews did not include a location, and only 19 (4.8%) out of them showed the age of the user. 195 online consumer reviews (48.8%) were about products and 205 (51.3%) about services. Within the group of products 61.5% were search goods and 38.5% experience goods. 95.0% of the review subjects contained a description of the product or the service. The online consumer reviews had 675 characters on average (M = 675.45, SD = 836.31), with a minimum of 19 and a maximum number of 10,120. The sampled comments contained 128 words on average (M = 127.80, SD = 159.30) with a minimum

of two words, and a maximum of 1856 words. The abstraction in the reviews ranged from 1 to 4 (M = 3.04, SD = .43), and the valence in the reviews ranged from 1 to 7 (M = 5.51, SD = 1.53).

In Table 1a, we show the descriptive statistics and the zero-order correlation matrix for the four variables we identified for capturing online consumer review platforms' design characteristics. As can be seen, most correlation coefficients are negative, indicating that those design characteristics are negatively correlated. All correlation coefficients are below .5, meaning that there were no signs of multicollinearity. The low correlation among the variables we identified shows that they capture different aspects of online consumer review platforms. In Table 1b, we show the cross tabulations of the four variables. In Table 2, we show how the variables vary across the investigated platforms.

[TABLES 1a,b & 2 ABOUT HERE]

Because reviews were nested in review platforms, we assessed an intra-class correlation coefficient (ICC) of the outcome variable language abstraction. We used language abstraction and not valence as outcome variable, as analyses in SPSS are limited to only one outcome variable per model. Moreover, it is the most important one in our study. The ICC describes "the proportion of variance that is common to each unit, as opposed to variation that is associated with data within their unit" (Heck, Thomas, & Tabata, 2011, p. 73-74). If there exists substantial variability between platforms (i.e., $p < .05$), it is necessary to conduct multilevel modeling to analyze the data (Heck et al., 2011). Results showed that the platforms accounted for 4.6% of the variance in reviews' language abstraction (Wald $Z = 1.39$, $p = .051$). Since the p-value is situated just above the significance level, we ran a linear mixed model to reveal if multilevel modeling is necessary. The covariance parameters table also suggests that after the introduction of the four parameters into the model, there is still significant variability to be explained within platforms (Wald Z = 13.965, p < .001) but not between platforms (Wald Z = 1.277, p = .202). The Wald Z test suggests that, even after controlling for the parameters within platforms, a statistically significant amount of variation in outcomes still remains within but not between platforms. A multilevel model for this research model is therefore not warranted. Moreover, in this specific situation the regression error probably correlates with a predictor in the

model, which could lead to poor estimates of parameter uncertainty (Bafumi & Gelman, 2006). A multilevel model is thus not advisable. Therefore, we looked at the level of the predictors.

Since product type could have an influence on detailed information in reviews, we controlled for this variable in a preliminary analysis. Regression analyses using SPSS were used to investigate if this had an effect on the results. First of all, we did not find any difference in reviews' language abstraction ($t(188) = .431$, $p = .667$) between search products ($M = 2.88$, $SD = .43$) and experience products ($M = 2.86$, $SD = .35$). Next, we also did a regression analysis and controlled for type of product. When type of product is included as a control variable to the base model with the four predictors, the explained variation increased with less than 1%, so the inclusion of product type as control variable did not explain that much added variation. This covariate could therefore be excluded from the analysis of the proposed SEM model.

5.2. Testing the Proposed Model

In order to test the proposed model and answer the research question SEM was used. The model was tested to investigate the suggested relationships. The model, shown in Figure 1, revealed an adequate fit of the data, $\chi^2 (4) = 5.285$, $\chi^2/df = 1.321$, $p = .259$, CFI = .995, RMSEA = .028. Consistent with our expectations, this model showed that online consumer review platform design characteristics predicted language abstraction in the accompanying online consumer reviews.

[FIGURE 2 ABOUT HERE]

All direct, indirect and total effects are presented in Table 3. First, the results showed a significant difference for reviewer identification. Online consumer reviews which featured reviewer identification were significantly more concrete in language, confirming Hypothesis 1. Meanwhile, reviews with a reviewer status had a significantly higher level of language abstraction, which supports Hypothesis 2. Instructions that online consumer review platforms give to reviewers were also used as

predictors in this model. The order of instructions did not relate significantly to the language abstraction in online consumer reviews (β = 0.10, p = .082). In other words, giving the instruction to first write an online consumer review and then rate the product or service did not significantly generate different levels of language abstraction compared to the instruction to first rate the product or service and then write a review. Therefore, Hypothesis 3 could not be confirmed. However, the analyses indicated that length instructions resulted in significantly more concrete written online consumer reviews. This confirms Hypothesis 4. Furthermore, results revealed that language abstraction in online consumer reviews positively predicted valence in online consumer reviews, confirming Hypothesis 5.

To test whether language abstraction in the online consumer reviews was a mediator of the relationship between the four predictors (e.g. reviewer identification, reviewer status, order of instructions, length instructions) and valence in the online consumer reviews, we used the bootstrapping procedure proposed by Preacher and Hayes (2004). The bootstrap confidence intervals of the indirect effects were estimated using a confidence level of 95% and 10,000 samples (Hayes, 2009). The analysis revealed that the relationship between reviewer identification and valence was significantly mediated by language abstraction, CI = [-.446, -.090]. In addition, results indicated that language abstraction also mediated the relationship between reviewer status and valence, CI = [.078, .290]. Although we did not find a direct effect of order of instructions on language abstraction when controlling for the three other predictors, we found that language abstraction was a mediator for the relation between the order of instructions and valence, CI = [.018, .235], To end, we found a significant indirect effect of the length of instructions on valence via language abstraction, CI = [-.281, -.064]. The results of the mediation test confirms Hypothesis 6.

[TABLE 3 ABOUT HERE]

6. Discussion and conclusion

This study discusses language abstraction in the written comments of online consumer reviews as influenced by design characteristics of their respective online consumer review platforms. With its focus on the writing behavior of reviewers, our study complements previous research that mainly discussed review effects on readers (Cheung & Thadani, 2012; King, Racherla, & Bush, 2014). The sample data for this study consist of 400 online consumer reviews from eight opinion-sharing platforms. Results indicate that four factors (i.e., reviewer identification, reviewer status, order of instructions and length instructions) successfully predict language abstraction in online consumer reviews. Thus, our findings reveal that differences in online consumer review platform elements are related to differences in the language abstraction of online consumer reviews. Earlier research reported effects on language abstraction in the offline context, showing that when psychological distance increases (a subjective feeling that something is far away from the self), one will think in a more abstract way, as opposed to when psychological distance decreases (Fujita et al., 2006; Trope & Liberman, 2003). This can be explained by the fact that high-level construals (abstract) are more likely than low-level construals (concrete) to remain stable as one gets farther away from an object. High-level construals, therefore, capture the central, superordinate features of an object and abstracting these high-level features conveys the overall meaning. For instance, when people are not instructed to write a minimum of characters about a product, they will only think of those general product elements that pop up quickly. Low-level construals, alternatively, contain subordinate, incidental features. In low-level construals, objects are specific and thus unique. On the one hand, statements at lower levels are easy to verify and interpret, on the other hand statements at higher levels are more open to dispute since they generalize what has been described. Our research can, therefore be understood from the *construal level theory.* However, alternative explanations could be given for every finding in this study, as listed below.

First of all, our results suggested that language abstraction differed significantly between the presence and absence of reviewer identification. Reviewers who know they are identifiable wrote more concretely than reviewers who did not. Supporting theories of computer-mediated communication, prior research already showed a strong relationship between adherence to norms of

online identity disclosure and online information disclosure (Mesch & Beker, 2010). This finding contradicts, however, research that found that anonymity (i.e., no reviewer identification) leads to increased willingness in expressing opinions and disclosing information (Haines, Hough, Cao, & Haines, 2014). Another finding was that reviewers with status wrote more abstractly than reviewer with no status. As suggested earlier, reviewers with higher status perceive themselves as superior to the less experienced users, and may be better able to analyze at a higher level because their knowledge on specific aspects accumulated over time (Rothaermel & Sugiyama, 2001). Next, we found that the presence of review instructions on the minimum length of a review generates more concrete language in reviews. Early research on online consumer reviews already demonstrated that length can affect both the information quality and quantity (Chevalier & Mayzlin, 2006). These researchers suggested that longer reviews represent more effort on the part of the reviewer, which would result in more concrete thinking. The order of instructions was not a significant predictor of language abstraction. The reason why we did not find a relation with abstraction could lay in the fact that a star rating in itself is a general assessment, and thus would be a very abstract tool. It is possible that the order of writing and rating could not be impacted by this prominently shown numeric summary statistic. No difference was found in language abstraction between search and experience products. Prior research, however, found that reviews about experience products contain more details and this be more concrete (Chung et al., 2006). However, we found a relationship between valence and language abstraction in written comments (Semin & Fiedler, 1988). When reviews are written more abstractly, those reviews are also written more positively. Prior research found as well a positive relationship between language abstraction and valence in product descriptions (Schellekens et al., 2010). We have to remark, however, that we could not test in this content analysis whether abstract reviews lead to positive attitudes or satisfaction of readers towards products and services. This implies that we could not assume that the language abstraction in reviews generate, for instance, more sales (Chevalier & Mayzlin, 2006). However, reviews which are concrete and contain more details should be perceived by prospective purchasers as more helpful (Bharati & Chaudhury, 2004; Chua & Banerjee, 2016). By our research, we now provide review platforms with tools which could enlarge the chance that reviewers write detailed concrete reviews. Lastly, results showed that language

abstraction mediated the relationship between the four online consumer review platform design characteristics and valence. Remarkable is, that we found an indirect effect of order of instructions on valence via language abstraction although we did not find a direct effect of order of instructions on language abstraction. Due to controlling for the other design characteristics, we did not find a significant but a marginal significant direct effect of order of instructions on language abstraction (see hypothesis 3).

All four design characteristics represent variations in platform design that are available in existing review platforms, which allows for field testing of our ideas, and at the same time ensures that each of these factors can be changed by platform owners. In this way, our findings not only provide a field test of construal level theory: they can also be implemented in the design of review platforms to optimize the language use of reviewers.

6.1. Implications of the findings

By demonstrating that design characteristics impact language abstraction in online consumer reviews, and ultimately make reviewers more positive in their review writing behavior, our study has various implications. First of all, the interaction between reviewers and online consumer review platforms has an impact. Thus, as discussed earlier, the implementation of an e-WOM system that allows reviewers to easily write reviews must be one of the key success factors of an opinion-sharing platform. Next to design characteristics platforms can easily change when building their design, other factors could impact reviewers' thinking and writing such as the volume of prior reviews (Maslowska, Malthouse, & Viswanathan, 2017) and the language used in those reviews (Aerts, Smits, & Verlegh, 2017). Second, the development of a communication channel connecting reviewer to reviewer is a requirement, as well as a channel between the shopping site and the customers. For example, it is helpful for enhancing the identification of reviewers to encourage consumers to reply to prior reviews by helping other consumers in their decision making process. Research even found that intrinsic motives (e.g., desire to help other customers) are very important as antecedents of e-WOM participation (Yoo, Sanders, & Moon, 2013). Third, online consumer review platforms should stimulate reviewers to write concrete reviews which are seen as more detailed and therefore as more

credible and helpful by the readers (Jiménez & Mendoza, 2013). Firms and organizations can do this by asking reviewers to give profile information which is linked to personal information or by giving instructions on writing reviews. A practical implication of our study is thus that we provided an empirically based set of design suggestions that may help to uncover the full potential and benefits of information sharing on online consumer review platforms. For example, based on the finding that reviewer identification is positively related to concrete review writing behavior, website developers might want to adopt a review format in which reviewers are asked to write more concretely. This can be done in a more direct way (i.e., asking a minimum length of review) or in a more indirect way (i.e., asking a profile picture or other identification elements). Although this study focuses on online consumer reviews, its findings could be tested in other contexts. While this general pattern should hold across contexts, context-specific variations could be identified, such as the relation between motivations and WOM content. Writers in online system context have different motivations to spread the word, this motivation may have been strengthened by the online review context (Askalidis et al., 2017). In other contexts, such as email or social media platforms, self-enhancement or other motives may play a larger role (Berger & Milkman 2012). It could be advisable to reward writers when writing concrete, helpful comments. This will lead to more valuable comments which, at their turn, increase the value of the platform as concrete language is seen as more verifiable (Semin & Fiedler, 1988).

A methodological implication of our findings is that consumers should refrain from using only the recommendation scores (i.e., star ratings). Although star ratings do provide an important contribution for prospective buyers, they explain only part of the variance in usefulness and helpfulness (Willemsen et al., 2011). Earlier studies also observed that the majority of the online consumers reviews receive positive scores (Mulpuru, 2007; Resnick & Zeckhauser, 2002). Per se, recommendation scores do not offer that much information as written comments do (Jiménez & Mendoza, 2013). Moreover, those star ratings ‘‘fail to convey important subtleties of online interactions’’ (Resnick et al., 2000, p.47).

6.2. Limitations and future research

Although our study may provide insight in the relationship between online consumer review platform design characteristics and writing behavior of reviewers, there are at least two important limitations worth noting. First of all, the naturalistic design of the current study requires some caution in making causal inferences. In order to check for improper relationships, we made a good attempt to isolate the effects of design characteristics from those derived from third variables. Nevertheless, it is possible that other, non-measured variables influenced our results. This is especially relevant for the results for "order", where the "ratings first" condition was present in only one out of eight platforms. In addition, a content analysis does not allow for measurement of consumer characteristics like personal involvement with the product or key motives of consumers' e-WOM intention (Cheung & Lee, 2012). Such variables may be important to take into account, since effects of reviews are mostly caused by an interaction between a platform factor and source factor, content and receiver characteristics (MacInnis, Moorman, & Jaworski, 1991). For instance, the impact of length instructions could be dependent on consumer characteristics such as expertise or involvement, which may influence the number of words a reviewer uses to describe their experience. The relationship between language abstraction and valence could be explained by the reviewer's product or service attitudes as well. Prior research already demonstrated that positive experiences with products were described more abstractly and more positively (Schellekens et al., 2010; 2012). Consumers that are more satisfied could be more positive, but also more abstract in their reviews. However, random variation in the individual characteristics of customers who provide these reviews would add "noise" to our observations and our confidence in the relevance of the theoretical framework is strengthened by the fact that we find significant results in the presence of individual differences. Of course, it might be interesting to rule out such variation, but it is difficult to imagine how this could be done in a setting, where existing reviews are examined: to obtain information on product involvement and other personal differences, reviewers would have to be contacted. Next, it is possible that websites attract customers that differ in terms of their construal level. To this extent, it is important to note that our results cannot distinguish between such a selection mechanism (whereby platforms attract customers whose trait-like construal level "matches" the construal level of the website), and a priming mechanism, in which platform characteristics induce a temporary construal level (state) that

influences their language use. Experimental research should be carried out to single out causal platform effects and control for source effects. Of course, reviewer factors (e.g., purpose and motivation for information sharing, Internet experience and prior knowledge) will also make a difference in which factors are applicable and which factors are used during the evaluation (Flanagin & Metzger, 2007).

A second, and final methodological limitation is that we could not control for people's mental construal. Our study assumes that the various design characteristics that online consumer review platforms could adapt are associated with different levels of construal. Noticeable is that people also could think in a specific mental construal. Additional research should extend our proposed model by doing experimental studies on the effects of design factors on the one hand on writing behavior but on the other hand on consumer behavior measurement scales while controlling for respondents' mental construal. The Behavioral Identification Form (BIF), a classic measure of level of construal, from prior research could be adopted (Fujita et al., 2006).

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Footnotes

[1] This study focuses on language abstraction based on the linguistic category model. However, abstraction in language use can also be conceptualized via a 7-point scale running from concrete (1) to abstract (7). We did not opt for using this last scale due to inter-subjectivity matters. However, both measurement tools had a moderate positive correlation ($r = .345$, $p < .001$).

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Table 1a

Descriptive statistics and zero-order correlations between predictors

	M (SD)	Reviewer identification	Reviewer status	Order of instructions	Length instructions
Reviewer identification *(0 = absent, 1 = present)*	.94 (.25)	1	.174***	-.068	-.100*
Reviewer status *(0 = absent, 1 = present)*	.30 (.46)		1	-.083	.249***
Order of instructions *(0= first rate, 1= first write)*	.88 (.33)			1	-.488***
Length instructions *(0 = absent, 1 = present)*	.38 (.49)				1

Note. N = 400; *p < .05; **p < .01; ***p < .00

Table 1b

Cross tabulations for predictors

		Reviewer status		Order of instructions		Length instructions		N
		0	**1**	**0**	**1**	**0**	**1**	
Reviewer identification	**0**	6.50%	0.00%	0.00%	6.50%	3.25%	3.25%	26
	1	63.25%	30.25%	12.50%	81.00%	59.25%	34.25%	374
Reviewer status	**0**			12.50%	57.25%	41.75%	28.00%	279
	1			0.00%	30.25%	20.75%	9.50%	121
Order of instructions	**0**					0.00%	12.50%	50
	1					62.50%	25.00%	350
N		279	121	50	350	250	150	**400**

Table 2

Platform characteristics: For how many reviews (out of 50) does the platform provide the information?

	Reviewer identification	**Reviewer status**	**Order of instructions**	**Length instructions**
Amazon	49	0	50	50
Epinions	50	0	0	50
Iens	50	6	50	0
Kieskeurig	50	0	50	0
Qype	25	28	50	0
Rate It All	50	0	50	0
Tripadvisor	32	38	50	50
Yelp	50	49	50	0

Table 3

Standardized direct and indirect effects from single-level SEM predicting language abstraction and valence in reviews

	Language abstraction	**Valence**	
	Direct effects	***Direct effects***	***Indirect effects***
Reviewer identification	-.16***	n/a	-.04
Reviewer status	.21**	n/a	.05
Order of instructions	.10	n/a	.03
Length instructions	-.20***	n/a	-.05
Language abstraction	n/a	.24***	n/a

Note. N = 400; *p < .05; **p < .01; ***p < .001

Figure 1. Hypothesized model examining the impact of different review platform design characteristics on language abstraction and valence in online consumer reviews.

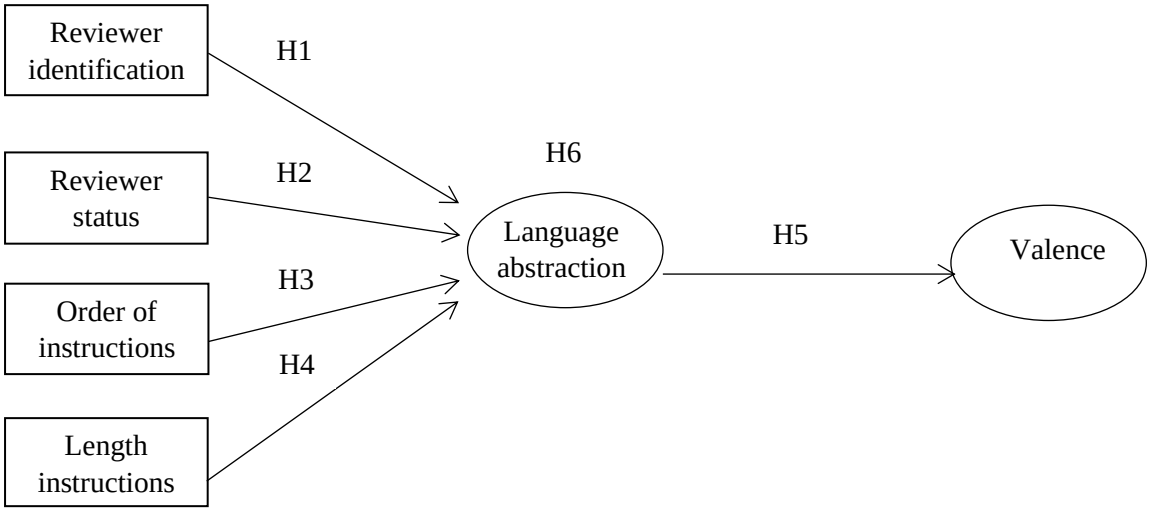

Figure 2. Proposed model examining the impact of different review platform design characteristics on language abstraction and valence in online consumer reviews.